Amendment to the Specification

Please replace the paragraph starting on page 1, line 23, with the following corrected paragraph:

This invention is directed to solving these and other problems and disadvantages of the prior art. According to one aspect of the invention, an apparatus comprises a capacitor having a body and a pair of terminals attached to the body, and a conductor defined on the body and connecting the terminals, the conductor having an inductance defining together with a capacitance of the capacitor a parallel LC circuit. The circuit is tuned by varying the width of the traces. The apparatus is illustratively suited for use as a notch filter. According to another aspect of the invention, a notch filter having a notch center frequency comprises a capacitor that has a body and a pair of terminals attached to the body and that has a self-resonant frequency equal to or greater than the notch center frequency, and further comprises a conductive trace that has an inductance and that extends along the body and connects the terminals. Illustratively, when mounted on a printed circuit board (PCB) in a signal line proximate to a ground plane, the notch filter and the ground plane form a virtual conductive loop the product of whose inductance and capacitance is the notch center frequency. According to yet another aspect of the invention, a PCB comprises a signal conductor comprising a pair of discrete conductor segments defined by the PCB, a ground plane defined by the PCB, a capacitor having a body and a pair of terminals on the body that connect the capacitor between the segments, and a conductor defined on the body and connecting the pair of terminals. The conductor has an inductance and forms with the capacitor a notch filter for the signal conductor such that the product of the inductance and the capacitance of a virtual conductive loop formed by the notch filter and the ground plane equals a center frequency of the notch of the notch filter.

Please replace the paragraph starting on page 3, line 7, with the following paragraph that includes a corrected heading:

Detailed Description of the Invention

Fig. 1 shows an illustrative embodiment of a notch filter **100** mounted on a printed-circuit board (PCB) **120**. Notch filter **100** spans two segments **124a** and **124b** of a printed-circuit conductor **124** carrying signals that are to be filtered for EMI. Each segment of conductor **124** terminates in a solder pad **126** to which notch filter **100** is electrically connected, e.g., by a component surface-mounting process.

Please replace the paragraph starting on page 4, line 3, with the following corrected paragraph:

As is known, capacitors have an individual self-resonant frequency f_c below which they behave capacitively and above which they behave inductively. Typically, the smaller is the capacitance of a capacitor, the smaller is its physical package, and the higher is its self-resonant frequency f_c. For ease of design, it is desirable that self-resonant frequency f_c of capacitor **102** equal or exceed f_n. At this self-resonant frequency f_c, the capacitance C of loop **130** is effectively the capacitance of capacitor **102**. Consequently, the required inductance L of loop **130** is $L = 1/(4\pi^2 f_n^2 C)$. Inductance L is provided by loop **130**. Inductance L is related to loop height h_l as follows: $L = 5(10^{-3})\, ln\, (\frac{4h_l}{d})\, l$, where L is measured in μH, h_l is measured in mils, *l* is the length of trace **106** in inches, and d is the diameter in mils of an equivalent circular cross-section having a circumference πd equal to twice the sum of the width w and thickness t of trace **106**. L is tuned by varying the width w of trace **106**. It is assumed that the thickness t of trace **106** is a standard and unvarying approximately 1 mil (.~7 to ~1.4 mil) of copper, aluminum, or other conductor; i.e., the standard thickness of a printed circuit trace. Given the dimensions of conventional surface-mountable capacitors, values of L that are reasonably achievable by varying the width w of trace **106** are between about .2 nH and about 1.5 nH.

Please replace the paragraph starting on page 6, line 19, with the following corrected paragraph:

Fig. 2 shows a load line **204** that defines the value of w as a function of h_g at f_n=1 GHz for a 27 pF 0603-type capacitor. As described above load line **204** is derived by superimposing two surface plots, with their intersection being the load line for a given notch filter center frequency fn._One of the surface plots is a plot of the achievable resonant frequencies as a function of the width w of trace **106** and the depth h_g of the reference return path. This surface plot is for a given fixed capacitance of 27 pF in this example. Also, in this example, $h_l = (30 + h_g)$ mils. Next, a reference plane is superimposed onto the aforementioned first surface plot. This reference plane is the desired notch filter resonant frequency f_n of 1 GHz in this example. The intersection of these two surfaces is line **204** that highlights the needed width of trace **106** as a function of the depth h_g of ground plane **122** within printed circuit board **120**. The 27 pF 0603-type capacitor is currently believed to be the only capacitor that will provide a 1 GHz notch filter for any depth of ground plane **122** within a conventional 62 mil thick printed circuit board **120**. There are other capacitor values that can provide a 1 GHz notch filter;

however, these other values will prevent the depth h_g of ground plane **122** from covering the entire 62 mil thickness of PCB **120**. In these cases, the depth h_g of ground plane **122** must be greater than some minimal depth, or will only work within some subset of the entire 62 mil PCB ~~thickenss~~ thickness. These constraints are restrictive and limit the practicality of using anything but an 0603-type 27 pF capacitor.

Please replace the paragraph starting on page 7, line 14, with the following corrected paragraph:

Instead of using one capacitor **102** and trace **106** to implement notch filter **100**, a plurality of capacitors can be connected in parallel to form capacitor **102**, and one or more of those capacitors can carry traces that together, in parallel, form trace **106**. If capacitors of slightly-different values are used in parallel, the result is a plurality of slightly-different notch filters – or, equivalently, a notch filter having a wider notch – ~~resuting~~ resulting in improved EMI attenuation. One of the advantages of a notch filter **100** constructed in the illustrative manner is that it occupies a very small amount of PCB real estate. To preserve this advantage in the case of a notch filter ~~eostructed~~ constructed from a plurality of capacitors, the capacitors may be vertically stacked, illustratively as described in U.S. patent ~~aplication~~ application serial no. 10/292,670, filed on November 12, 2002, now abandoned, and assigned to the same assignee as this application. In this illustrative example of a 1 GHz notch filter, a 23 pF 0603-type capacitor may be used in parallel with the 27 pF capacitor. The load line for the parallel combination of the 23 pF and 27 pF capacitors is shown as load line **202** in Fig. 2.

Please replace the paragraph starting on page 7, line 30, with the following corrected paragraph:

Of course, the invention may be used to implement notch filters at frequencies other than 1 GHz. ~~Illustatively~~ Illustratively, Fig. 3 shows a load line **304** for a surface-mountable 0402-type capacitor (length of 40 mils, width and height of 20 mils) of 1.7 pF used to implement a 4.8 GHz notch filter. h_g is the depth at which a ground plane is buried in a PCB, and w is the width of a trace. Correspondingly to the example Fig. 2, the 1.7 pF capacitor may advantageously be used in parallel with a 0402-type capacitor of 1.508 pF to implement the 4.8 GHz notch filter. The load line for the parallel combination of the two capacitors is shown as load line **302** in Fig. 3. Also illustratively, Fig. 4 shows load line **404** for a surface-mountable 0402-type capacitor of 1.023 pF used to implement a 6.1 GHz notch filter. Again, this capacitor may advantageously be used in parallel with an 0402-type capacitor of 0.9 pF to implement the 6.1 GHz notch

filter. The load line for the parallel combination of the two capacitors is shown as load line **402** in Fig. 4. h_g is the depth at which a ground plane is buried in a PCB, and w is the width of a trace

Please replace the Abstract paragraph starting on page 12, line 1, with the following corrected paragraph:

Abstract of ~~th~~ the ~~Disclosur~~ Disclosure

An ultra-high-frequency notch filter (**100**) comprises a capacitor (**102**) defining a conductive trace (**106**) on its body (**103**) and extending between its terminals (**104**). The trace has an inductance that forms a parallel LC circuit with the capacitance of the capacitor. When mounted on a printed circuit board (**120**) to connect two segments of a signal line (**124**), the notch filter and a ground plane (**122**) of the PCB form a virtual conductive loop having an inductance and a capacitance whose product is the center frequency of the notch of the notch filter. The center ~~ferquency~~ frequency is tuned by varying the width of the trace.